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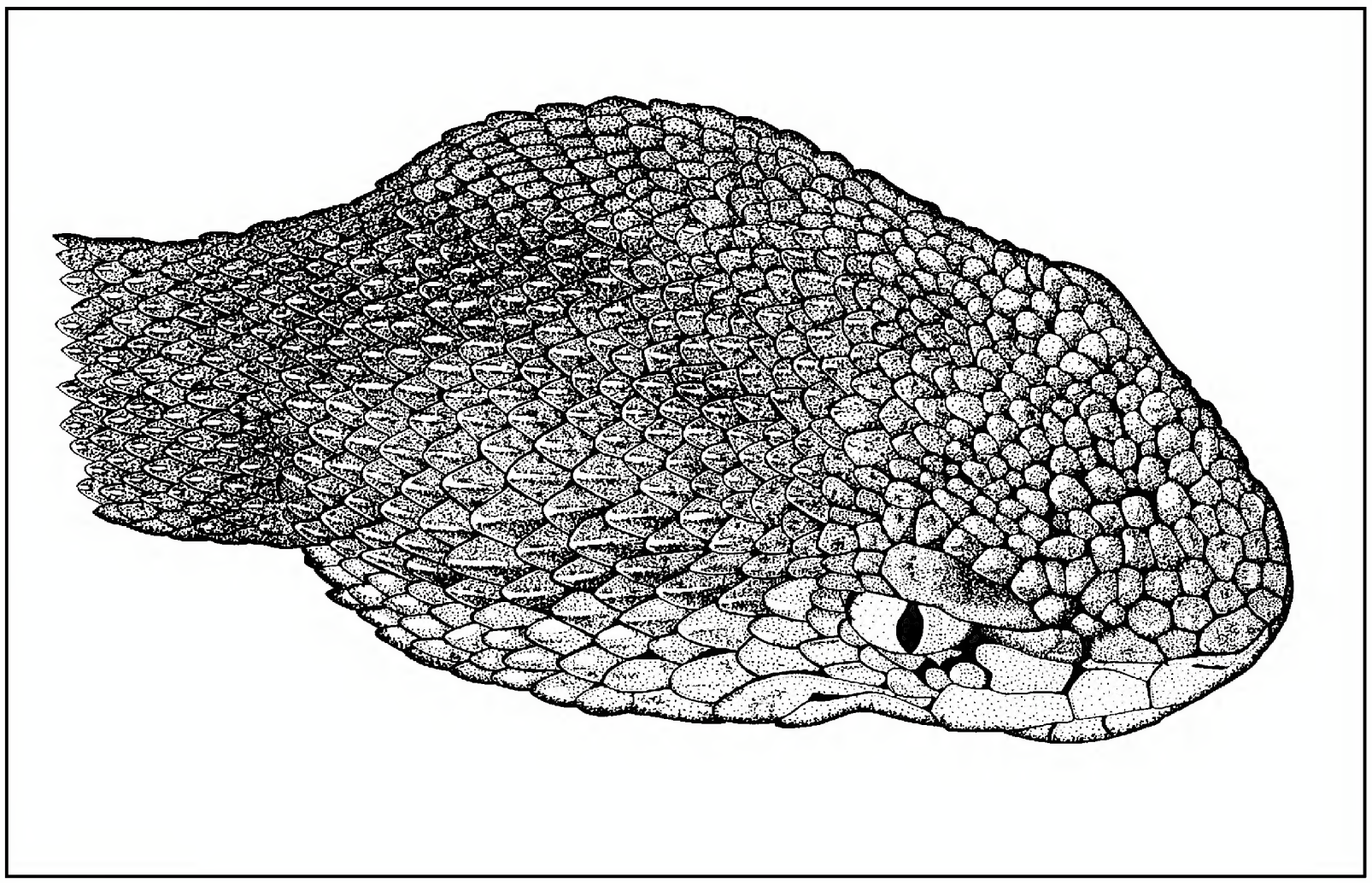

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Serpents in the Sky, Snakes in the Storm Drains… A Real Life Herpetological Story from Melbourne, Australia . Raymond Hoser 141

Note on Reproduction of Whipsnakes, Genus *Chironius* (Serpentes: Colubridae), from Costa Rica . . . . . Stephen R. Goldberg 148

Book Review: *The Amphibians and Reptiles of New York State: Identification, Natural History and Conservation* by James P. Gibbs, Alvin R. Breisch, Peter K. Ducey, Glenn Johnson, John L. Behler and Richard C. Bothner . . . . . James N. Stuart 150

What You Missed at the August CHS Meeting . . . . . John Archer 152

Notes on the 2006 Midwest Herpetological Symposium . . . . . Holly Carter 154

The Tympanum . . . . . William B. Montgomery 156

Unofficial Minutes of the CHS Board Meeting, August 17, 2007 157

News and Announcements 158

Advertisements 160

Cover: *Trimeresurus erythrurus*, one of the Asian green pitvipers. Drawing by R. Michael Burger

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Serpents in the Sky, Snakes in the Storm Drains... A Real Life Herpetological Story from Melbourne, Australia

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Introduction

The following is adapted from a report I had to make to a psychiatric hospital in relation to a "snake problem" they had. So that readers may get an insight into the sort of reports made to companies and entities by "snake consultants" here in Australia, the report that follows is only slightly altered to suit the readers of this journal. Readers should be mindful that what follows is written with the lay person in mind and in terms of people who do not want to cohabit an area with deadly venomous snakes.

The commencement of the story was when I got a call from a woman who had been alerted to a snake that had fallen into a courtyard at a sealed psychiatric hospital/prison. It was later ascertained that the "snake from the sky" had actually fallen from the roof of a building in the hospital compound. The compound is sealed from the outside world by a smooth prison style wall, security monitoring and the like. Entry to the complex is via several locked doors, security checks, metal detectors and biometric scanning.

In other words, it seemed impossible for a snake to get inside. But that was the beginning of the story of the snake from the sky and the others in the drainage system. The report to the state government follows and gives a full perspective on the situation.

The hospital is located in an inner Melbourne suburb about 5 km in a straight line from the Melbourne city center. Melbourne, Australia's second largest city, is a large, densely populated metropolis of over 3 million people. Snakes are not usually associated with inner suburbs by most people, but are in fact common in inner parts of Melbourne that have remnant bushland and are in proximity to the Yarra River and tributaries that flow through various parts of the city, including the central business district.

"Snakebusters" is the trademarked snake removal service owned by myself, which is by far the best known snake removal service in Australia, having been in existence for some years and reported in all types of media including evening news bulletins. During summer months, I field calls on a daily basis from persons wanting deadly venomous snakes removed from properties, usually within the city environs. People pay for removal of the snakes, which by law must be released in suitable habitat away from houses as close as possible to where the snake was found.

While calls are taken on a 24-hour basis and snakes removed as the calls come in, the vast majority of calls are during the day and statistics show that the majority of these are between 3 and 6 P.M., which coincides with the warmest part of the day. Unlike most other parts of Australia, Melbourne's climate is relatively cool (midwinter average maximum of 13°C and a midsummer average maximum of 25°C), and hence the activity of the mainly diurnal snakes reflects the limited options given by the generally cool and erratic weather.

The report's introduction

At about 5.30 P.M. on 18 January 2004, I (Raymond Hoser) received a phone call (at Snakebusters) to remove a small (about 60-cm) snake seen within the grounds of the Thomas Embling Psychiatric Hospital at Yarra Bend Road, Fairfield, in inner suburban Melbourne. The snake had been seen about 45 minutes earlier, having "fallen from the sky" (later ascertained to have come off a nearby roof).

I arrived at about 6 P.M. and inspected the area for about an hour without seeing the snake. It had apparently made off into a thick bed of vegetation that included ivy and other creeping plants. From here the snake could have gone in several directions, including to inaccessible places.

The following week I was phoned by Kate Boylan at the hospital to come in and survey the grounds with a view to establishing the means of entry for this snake and look into three other snake sightings in the recent past. On the morning of 23 January 2004, I returned to the hospital and was shown around the grounds by staff in order to establish the likely means of entry by two of the snakes and how to:

1) Stop snakes entering.

2) Deal with snakes that do enter the grounds.

3) Deal with other aspects of the snake problem at the hospital, including:
   - problems outside the perimeter of the hospital
   - liability issues
   - the viability of reducing snake habitat outside the hospital grounds, but adjacent to them.

Earlier sightings

Within previous weeks (?) four sightings had been made and reported, including two inside the walls of the hospital and two in the carpark area immediately outside on the general grounds of the hospital. In no cases were the snakes identified as to species and any such identification by lay persons would under normal circumstance be doubted anyway. This is due to the fact that lay people usually identify snakes on the basis of color, which is not a reliable indicator. However, I was certain beyond reasonable doubt that the snakes in question were all tiger snakes (*Notechis scutatus*) (see later in this report).

I was told that the snakes were of different size classes and hence included more than one specimen. The most recent sighting (to which I was called) was of a snake that had fallen from the roof of a building and onto a grassy area. Clearly that snake did not have an obvious means by which to return to where it had come from. This led to the initial view that snakes may be entering the hospital grounds and then were unable to escape. Other sightings were generally within the vicinity of drainage grates or pipes (see later), leading to the (probably correct) assertion that snakes were entering the grounds via the underground drainage system.

Tiger snakes

That the snakes in question were tiger snakes is not to be doubted. In the Fairfield area, they are the only species known to occur and are one of three deadly species common to many parts of Melbourne. Snakebusters receives numerous calls each year from Fairfield and adjacent suburbs, including Kew, Ivanhoe, Heidelberg and Abbotsford, to remove snakes and all have been tiger snakes.

The only other species of snake I have seen in the general area was in 2000—a large copperhead (*Austrelaps superbus*) in a jar at a public park in Abbotsford, mislabeled as "Large Brown Snake." That snake may not even have been caught in the Abbotsford area, although this species does occur further up the Yarra Valley including in Warrandyte, where they are still less common than tiger snakes. However, copperheads do not climb onto house roofs and hence probably could not have been the species seen on 18 January 2004.

The third deadly species common to Melbourne, the eastern brown snake (*Pseudonaja textilis*) is most common on the basalt plains north of the city and while it may travel across suburban areas, there is no evidence to suggest the species is present in Fairfield. Nor does this species climb onto roofs, or use drainage systems to get around. Instead it moves along fence lines and similar and hence could not have gained entry to the inside of the grounds of the hospital.

Tiger snakes are common along the Yarra Valley and by far the most common species of snake in Melbourne. Snakebusters receives more calls for these snakes (based on statistics of what we actually catch) than for all other reptiles put together (snakes and lizards misidentified as snakes). In the season 2003-4, we had calls for this species from the following suburbs: Laverton, Newport, Abbotsford, Kew, Fairfield, Alphington, Ivanhoe, Eaglemont, Heidelberg, Preston, Greensborough, Templestowe and numerous other suburbs in Melbourne.

The tiger snake is a true generalist in that it is somewhat nonspecific in habits. It has literally conquered Melbourne, being adapted to its harsh (for snakes) climate in terms of the cool and erratic weather. While tiger snakes prefer rocky and overgrown habitats, preferably near water, as they like to have a regular drink, they will wander across areas of seemingly inhospitable habitat, particularly during hot weather. This is particularly true for subadults and males in search of mates.

Born at about 17 cm (average 23 a litter) in January to May and growing at about 1-1.5 cm a month until mature (in the wild state), most take about 3 years to mature and 4 years to reach their maximum size. Non-growing adult males average just over a meter and females just under a meter.

These snakes tend to live on the ground and rarely stray from the ground to climb. Two circumstances where tiger snakes *will* climb are: to catch birds in a nest in a tree or other high structure; to climb out of a pipe or drainage hole, in which case the snake simply heads towards to light at the end.

Tiger snakes are generalists in that they feed on any vertebrate and even in the wild state will eat pieces of discarded meat and chicken as dropped by a human. They do not need a supply of food where they live as when they are not fed, their body merely shuts down and stops growing. Hence these snakes can go for long periods (many months) without food and survive in apparently sterile areas like the hospital grounds.

Tiger snakes are a deadly species and their venom attacks the nervous system. While they are slightly slower moving than the average snake, they can still move fast when warm and agitated. Bites commonly occur when people try to catch and kill them. Decapitated snakes may still bite the person attacking them. As a rule, tiger snakes will attempt to bite if cornered or an attempt is made to kill them. In this regard they are one of the more aggressive species, hence the advice to lay people not to deal with them.

It is worth noting that as captives these snakes become quite placid and inoffensive and hence when seen at shows and exhibits are not the same aggressive animals that are seen in the wild state. Lay people should not be fooled by the different faces presented by the same species. Also some captives may have had their venom glands surgically removed, allowing the handler to take liberties with the snake, knowing that should a bite occur, then no serious consequences will result.

Advice if a snake is seen

The general advice to lay people who see snakes is to leave them alone, or if in a situation where they may pose a risk (such as within the hospital grounds) a licensed snake catcher should be called in to remove and relocate the snake. If a snake is seen and a snake catcher is called, the snake should be watched continuously (as best as possible) until the snake catcher arrives. This includes viewing potential escape routes. Do not leave the area unattended as the snake may move off in an unknown direction and then not be found by the snake catcher. Because most snakes have little if any scent, they are not suited to being found by sniffer dogs.

Stand at a safe distance from the snake (more than four meters) and if the snake does move towards you, then simply run off. If you are cornered, then stand dead still and wait for the snake to move off (even if it crawls over you). Snakes do not generally bite still objects. It is the movement the snake will strike at.

In case of snakebite

If bitten, wrap a broad constrictive bandage from the bite site, along the limb, to the trunk of the body. Stay as still as

possible and get to hospital as quick as possible. It's best to call an ambulance and/or have a person drive you there. Do not drive yourself to hospital as you may pass out while driving. There is no need to kill or attempt to identify the snake as hospitals have so-called polyvalent antivenom which works against all locally occurring snake species. If these procedures are followed, then the risk of death from snakebite is remote.

It is worth noting that even small (newborn) snakes carry deadly venom and their bite may make a victim very ill. This is especially so if the recipient has any form of allergy to the poison, which will not be known until after a bite has happened.

Symptoms of bite may be almost immediate (within seconds) or take hours to manifest, depending on a range of factors and hence if in doubt one should go to a hospital for monitoring for 24 hours (or more) after the bite.

Identification of tiger snakes

This is not particularly relevant here as we know this is the species in question. However for completeness a summary of the snake is given in terms of identification. Color is not a reliable indicator. Tiger snakes are known to range from white to black and be with or without bands. Most in Melbourne are however yellowish or greyish brown with somewhat indistinct bands.

To separate tiger snakes from the other two deadly species in Melbourne is quite easy. They have a broad, thickset head. Copperheads, also a thickset snake, have a distinctly smaller and narrower head. Brown snakes are a generally thinner snake with a smaller and narrower head. Brown snakes have distinct brow ridges that the other two species lack. Copperheads have white etchings on the lip scales; the other two species have solid-colored heads. These head characteristics are a reliable means to separate the three species.

Snake experts familiar with the three snakes can usually glance at part of the body of one of these snakes and immediately know which they are dealing with due to the suite of other characters that separate them. All grow to around a meter as adults, but range from as little as 15 cm total for newborns to two meters for large adults.

Essentials of tiger snake biology

In terms of what snakes need to live, most species, including tiger snakes, follow the same basic plan. Hence, in a captive situation, zoos and keepers can keep widely differing species in identical cages and feed them the same foods.

Translated to the wild state, the essential requirements remain the same. In order of importance they are as follows: 1. Thermal requirements; 2. Habitat; 3. Food and water.

Thermal requirements

As reptiles, snakes cannot regulate their body temperature metabolically. Their temperature is controlled by their environment. Tiger snakes can therefore survive in good health anywhere between about 4 and 38°C. However, these snakes must have a temperature of about 30°C to best digest their food and below 20°C cannot carry out this basic function. Hence, this species is pre-adapted to seek a temperature of about 30°C at all times if they can (which in the wild state is obviously an impossible and rarely attained dream).

Seeking a preferred body temperature is the primary preoccupation of almost all snakes almost all of the time. Most of the time this means that the snakes are seeking heat, and/or avoiding cold, except in the warm days in the warm months when the reverse applies. On hot sunny days when the air temperature is 30°C or higher, the ground temperature may well be ten to fifteen degrees hotter. As snakes crawl over the ground or rest on it, this is the temperature that counts.

Temperatures of 40–45°C (even for just minutes) are fatal to the snakes and hence must be avoided. Under such conditions snakes will seek out cooler and shaded southerly (and east-facing) slopes for refuge. When the weather cools, the snakes will again seek sunny spots so as to continue feeding and digestion processes. If an area's thermal requirements are unsuitable for snakes, they will either move away (at least as long as the area remains unsuitable) or if unable to do so, simply die.

Habitat

Habitat is the second most important requirement of snakes and the feature most readily identified by lay people. In the world of wild animals, snakes are somewhat constrained. They have no arms, no legs, are deaf to airborne sounds and almost blind. Put another way, they are the slowest animal on the block. To get over these disadvantages snakes rely on their cryptic coloration to hide and blend in with their surroundings. They will prefer areas of dense vegetation at ground level, hide in cracks that are too small for predators such as birds and foxes and when they move will tend to secrete themselves along edges of buildings where birds cannot readily swoop on them. If snakes cannot find areas of suitable habitat, they will tend to move on. In the context of a hospital, removal of densely vegetated flower beds will remove incentive for snakes to reside in a single spot within the hospital grounds.

Food and water

While a snake deprived of food and water will obviously die, these are nowhere near as essential for the well-being of snakes as the other two factors covered. Snakes can sometimes go for weeks without water and months without food. Hence the absence of either does not mean an absence of snakes.

Areas with plenty of food and water and which satisfy the essential requirements of thermal needs and habitat will support large numbers of snakes. This is why the Yarra River valley supports a large number of snakes.

Under optimal conditions tiger snakes may overproduce young each year resulting in a general movement of subadult snakes to new areas adjoining the optimal habitat, hence a general flow to areas such as the Thomas Embling Hospital and the nearby suburbs. When habitat is suitable in these new areas (particularly in the form of overgrown gardens, fish

ponds and so on), snakes are able to live and breed and so the cycle goes on.

While water is not an essential requirement for snakes due to their pre-adaptation to store water and pass dry urine, the fact is that snakes have a weakness for water and love to take a regular drink. In captivity snakes will on most days take a drink from their water bowl, especially after eating. In the wild state, this means that a snake will frequent watering points and properties that have such watering points are favored places for snakes.

In the context of the Thomas Embling Hospital, this was an important factor enabling snakes to survive indefinitely within the hospital grounds. Water accumulations were seen at the bottom of one of the drainage grates (just outside the walls, but linked to inside) and may have been present elsewhere as well.

Means of entry to the hospital

An inspection showed that the hospital was literally sealed at the walls. The high-security walls surrounding the complex are sealed at ground level and due to their smooth surface could not possibly be climbed by any snake. To get into the building requires biometric scanning and entry through several locked and sealing doors. No snake could conceivably enter via this means without being detected and none have been. Freight is brought in via a large door that also seals at ground level, including at the edges (ends), meaning entry from here is also probably impossible and/or hasn't occurred.

The only other means by which snakes could enter the complex was via the drainage system. In fact this was effectively custom-made to give the snakes unfettered access to the hospital. At ground level there were drains crisscrossing the grounds of the complex. These were interconnected by pipes with frequent points where a grate presented at ground level. The drop from the grill to the bottom was usually only a short distance (under a meter) enabling the snakes within to either bask in the midday sun (while remaining protected by the grill) or to climb out of the drains (at the corners of the square holes) and through the grill if desired.

These pipes ran under the hospital walls and to the outside. To the east of the hospital was bushland adjacent to the Yarra River, which is known tiger snake habitat. To the south was a football oval, lined on the south side by the Eastern Freeway. However between this (effectively unpassable for snakes) oval and the south wall of the hospital was a densely vegetated ditch with water holes. This linear reserve formed a perfect conduit and funnel for snakes moving east from the Yarra River towards Merri Creek, which in turn was sited on the west side of the hospital.

Noting the smooth face of the hospital wall on the east side and the similarly impenetrable open ground of the oval and freeway to the other side of this ditch, it is clear that snakes would be funneled naturally into the ditch or any pipe running under the hospital wall. The ditch itself provides excellent habitat for the tiger snakes in terms of vegetation and water. Notwithstanding this, the ditch has fundamental limitations in terms of its long-term utility as tiger snake habitat and this no doubt contributed to the entry of snakes into the hospital grounds and the timing as well. Snake movements are seasonal and also in direct response to prevailing weather. In cooler months they tend to remain on north and west facing slopes, where they can take advantage of the maximum sunlight to warm themselves.

Snakes do not need the sun itself, but rather the heat, and while the two are commonly confused by lay people, snakes usually bask in the safety of dense ground level vegetation such as ivy and other creeping plants or debris, where sunlight is either dappled, or when a snake may be able to bask completely concealed under the warming leaves of the vegetation.

While snakes may actively search for food, many species, including tiger snakes are also ambush predators in that they may instead choose to site themselves on so-called "runs" where they lie in wait and merely strike at food that passes within range. Runs tend to be along building edges, where rodents and lizards travel so as to avoid predation from large birds that patrol the open spaces.

As weather warms up, the need to bask is reduced, enabling the snakes to travel to new areas in search of food and habitat where safety from summer heat can also be obtained. The east-facing slope to the east of the hospital would therefore be colonized by snakes in the summer months. In hot weather as seen in much of December 2003, the snakes would in turn seek densely vegetated areas, including the ditch to the south of the wall of the hospital. As the weather cooled in January 2004, this south-facing ditch would become suboptimal and hence snakes would seek warmer places.

As a rule, snakes move to higher, more exposed (to sun) ground and west-facing slopes when weather cools and hence it'd be safe to assume a continued movement by the snakes along the south aspect ditch in a westerly direction and towards the carpark of the hospital. The swamp and overgrown vegetation there provides optimal habitat for the snakes. If and when the weather warmed up, the movement would be more or less reversed with the snakes heading back in an easterly direction. In other words, the movement of the snakes would be either up and down the ditch parallel to the south wall of the hospital, or even through the hospital itself, noting the east/west exits of pipes from within the hospital.

I was unable to ascertain the location of the outfalls of the pipes inside the hospital in terms of where they ran out of the grounds. But so long as they run either east, west or south of the hospital, snakes could gain entry. Notwithstanding this and based on the pattern of sightings in the hospital grounds, it'd be fair to assume that the snakes were gaining entry to the grounds from the carpark side of the hospital.

This means that if the weather warms up again in late January and February 2004, more snake sightings in the hospital are likely, regardless of what cleaning up of plant beds within the hospital grounds is done. It's also worth noting that Merri Creek to the west of the hospital is also tiger snake habitat and that snakes may be coming from there. Without knowledge of the drainage outfalls in terms of this area, any firm conclusions are not possible.

However, there are open grassy areas between the hospital and the gully and movement across here at ground level is effectively impossible. Hence the suspected original source of the snakes is more likely to be the east side of the hospital, rather than the west side despite the fact that sightings haven't been in this part of the complex.

There is another important consideration in terms of movements of snakes. In the wild state, snakes choose to move in a given direction. They will tend to move in a straight line to where they choose to go. Variation in the straight line movement is mainly due to physical impediments such as rocks, logs, patches of open ground and the like. Open ground will be avoided and snakes will try to move around it. In terms of roads, snakes will commonly move along the edges for some time before ascertaining that they have no choice but to run the gauntlet across open ground (and cross).

In a site like the Thomas Embling Hospital, snakes would encounter the wall and the clear ground around the perimeter and seek an alternative means to cover the distance and remain concealed. Hence the importance of the drainage pipes and/or the ditch on the south side.

Snake on the roof

The snake reported on 18 January was first seen falling off the roof of a building. Tiger snakes will climb buildings in order to get birds from nests and similar. The building roof from which the snake fell was connected to the ground via a vine growing up. The snake could have climbed this. Tiger snakes have a weakness for young birds, and snakes on roofs in these situations are seen most years by Snakebusters.

Alternatively in the case of the hospital, it is likely that the snake may have climbed up a pipe starting at ground level or lower, to emerge at the end, which happened to be on the roof. When moving through drainage pipes or other sealed environments, snakes will tend to head towards the light and emerge wherever the pipe ends, or the exit is. The pipes were relatively narrow and could be easily climbed by the snakes, even if their surfaces were smooth. If in a sealed environment such as under a house, the snake will as a matter of course move towards the light and attempt to escape via the hole through which the light shines.

In terms of "falling off the roof," snakes literally jump. They tend to stretch their body outwards as much as they can before falling and then as they fall, they land in a so-called break-fall, much like a person does when doing judo. The snake is not injured in any way. Due to their relatively light weight, their maximum velocity is not terribly fast, enabling them to fall/jump and survive from any height (the only exception being very large pythons).

Other sites where movement in drainage pipes occurs

It is probably quite common for snakes to use drainage pipes as movement conduits, although there are few if any cases in the literature. Snakebusters has received a number of calls for snakes in suburbs far removed from likely habitat. While movement along fence lines and the like cannot be discounted, the crossing of major roads, including freeways is most likely to be through pipes on some occasions.

In 2002, we removed a tiger snake from the Hill of Content Bookshop in Bourke Street, Melbourne city. The snake had been seen the previous night emerging from a drain in the street before it crawled under the shop's door.

A Sydney-based snake catcher, Charles Acheson, does regular removals of red-bellied black snakes (*Pseudechis porphyriacus*) from the Homebush Bay, Sydney, Olympics site. The snakes at the Homebush Bay complex tend to be found emerging from the drainage grates that are scattered across the complex and include open areas where the only source of entry is the drainage grate. In other words the snakes are moving around the complex via the drainage system.

In 1983 I retrieved a red-bellied black snake that had emerged from a drainage grate in Lawson Street, Redfern, in inner city Sydney. Red-bellied black snakes are similar to tiger snakes in most respects and tend to replace them in warmer more humid areas, such as wetter parts of the East coast.

The carpark area

The swamp in the carpark area was optimal tiger snake habitat for several reasons. The area had a generally neutral or westerly aspect, which is preferred by snakes. Vegetation was overgrown and at ground level ran over dark basalt boulders with honeycomb underneath. In Melbourne this is optimal. Snakes can bask on the dark, heat-gathering rock and hide amongst the vegetation and rocks without being detected.

While there were some pathways running through the swamp, most of it was effectively unused by people and hence the sort of place that snakes would like. Besides the thermal and habitat attributes, the water bodies were permanent as evidenced by the mature *Limnodynastes tasmaniensis* (frogs) tadpoles seen in the water. These frogs are one of the preferred foods of the snakes.

Finally, the swamp formed a so-called "habitat end point," in that it represented an area at the end of a line of potential habitat. To the immediate west end of the swamp was road and then mowed grassed field. As snakes funneled here in an east-west direction, they would find they could not go further and hence accumulate at this point. Hence it'd be reasonably expected that the number of snakes here would be large.

Such situations occur in the wild state as well (for example as in a rock outcrop at the end of a long ridge, or the end of an island, or end of a sand dune) and snake catchers know that these are the best places to look to find the snakes.

A further point of note is that as a generalization snakes don't like their own kind. Other than when mating (and sometimes overwintering), snakes are solitary animals that will avoid one another if given the chance. That's why when they are seen, they are usually seen on their own. In the wild state, when two snakes see one another, they will usually have a sort of stand-off, evidenced by raised heads and excess tongue flicker with the dominant (larger) snake getting right of way and the smaller one moving elsewhere. This explains the

movement of snakes away from the swamp area (itself the end of a funnel) and why snakes have been seen in suboptimal parts of the carpark. It also means that sightings in the carpark may occur again in future.

The idea that snakes and other reptiles can be funneled in directions is not new. Field workers use drift fences and pit traps to capture reptiles in bushland and desert areas with a high degree of success.

Habitat for snakes within the hospital grounds

The grounds of the hospital are generally sterile and not good for snakes. Buildings tend to run flush to the ground and vegetation in garden beds is sparse. Lawns are mowed short. It was evident that a significant number of people utilize the area, which runs against the preference of snakes for areas that humans don't frequent.

However not all was bad for the snakes. Several garden beds consisted of little more than densely matted ivy and other vegetation that formed an impenetrable shield for any snakes within. Some buildings, including the horticulture building have walls that don't run flush to the ground and also wooden floorboards that leave a space between the floor and the ground. While such a building is not a good site for a snake to live, it does provide a good short term refuge for snakes passing within the grounds and a means of escape if seen.

Part of the general habitat for snakes is that the ivy beds in some cases run to the drainage holes and hence form a complete habitat package for the snakes. By selecting sunny or shady sides of buildings as desired to suit thermal requirements and drainage holes as a source of water, snakes could survive within the hospital grounds indefinitely and perhaps undetected.

Where the snakes would hide

While snakes would use drainage pipes as conduits, it's unlikely that these would be the preferred resting place in the grounds of the hospital. Instead the snakes would more likely be found resting at or near ground level under the matted vegetation in the garden beds, or more preferably under cover such as rocks or rubbish within the garden beds.

Eliminating entry of snakes

The only means by which snakes could be stopped from entering within the hospital walls would be to block the drainage grates with fly screen or similar. This was at first deemed not viable as the result would be drain blockage and flooding. Hence it seemed that entry of snakes to the hospital grounds could not be stopped. However as a second best solution it was decided to block all drains with wire that would be kept clear and cleaned regularly.

Eliminating snakes inside the hospital grounds

Noting that entry cannot be blocked, the next matter of note is dealing with snakes already in the hospital grounds and those likely to enter. The thermal attributes of the grounds effectively cannot be altered and dealt with, leaving habitat as the important consideration. First and foremost the overgrown creeping vegetation at ground level should be removed. This will both remove habitat for the snakes and also make sighting of specimens easier. Snakes entering the grounds will thus be encouraged to move on and in any event be more easily detected as they move about in search of suitable habitat.

As discussed, it'd be wise to have a snake catcher such as myself present at the time the creeping ivy and similar vegetation is removed. This could be done within a day. However, regrowing shoots of ivy would have to be poisoned and it could take a year or two to remove all the offending vegetation.

Along the south wall of the hospital (on the inside) is a ditch with thick bulrushes. This also constitutes optimal habitat for tiger snakes. Discussion in terms of removing the bulrushes indicated problems removing this vegetation. The best option would be its complete removal, but failing this, staff should be made aware of the snake risks posed by its retention.

Cracks and holes in buildings and walls at ground level should be eliminated. This will in turn eliminate impenetrable hiding spots for mobile snakes. This may be difficult in terms of the horticulture building, but should be possible elsewhere.

Eliminating snakes in the carpark area

This is also problematic and involves a decision by management as to whether or not it wants a sterile, wildlife-free area, or to retain an area of natural beauty, which will as a matter of course also have snakes.

Overgrown and dense ground cover should be removed and regularly trimmed to remove hiding places for snakes as best as possible. This includes the dense bulrushes and other vegetation in the water proper and at the water's edge. Rocks in the area should be filled in underneath as best as possible to remove optimal hiding spots for snakes. The best means to do this is to dig under them, fill in the gaps with cement and then cover with dirt (thinly) so that the cement isn't noticeable. Even a complete razing of the swamp area will not remove the likelihood of snakes in the area and so perhaps the best option is to make the area snake unfriendly (within reason) and then to deal with the problem as it arises.

Dealing with the snake problem

In essence, no amount of work and preparation will eliminate tiger snakes from the Thomas Embling Hospital and immediate environs. Staff should be made aware of the problem and in areas where the public (and patients) are likely to go and encounter snakes, warning signs should be erected. Staff should be trained in dealing with snakes, including first aid, and to that extent Snakebusters will be happy to come to the hospital and do a full lecture on this at a pre-arranged time.

Management should be aware of the likely seasonal snake occurrences (in that sightings each year tend to fit a well-defined pattern) and should have a management plan to reduce the snake friendliness of the habitat and garden beds within the hospital grounds and immediate surrounds.

In terms of the ditch on the south side of the hospital wall,

management should seriously consider removing the sitting bodies of water and dense ground level vegetation, even though it was obviously planted to obscure the unsightly wall of the hospital from the people who would use the adjacent field. Perhaps trees and other plants on stems could be planted and the ditch itself filled in to present a flat ground surface. In terms of snake sightings, Snakebusters should be called to remove them as and when they are seen.

Covering the ditch on the inside of the south wall, while expensive, may reduce the snake risk further, but still not eliminate it and frankly is probably not worthwhile.

Liability issues

Not being lawyers, Snakebusters cannot give good legal advice on this. However the following points are noted.

VicRoads* were said to be liable in terms of two recent snake incidents in Melbourne. At Deer Park, they were alleged to be liable for a snakebite that occurred as a result of their failure to clear land that led to a person being bitten by a snake that was present on the land. The ultimate outcome of that case, which was reported in the media, isn't known. However, following this incident, a man at Epping (Mr. Ken McDonald) approached VicRoads to fix a fence and adjoining reservation where snakes had been seen and VicRoads paid up immediately. No questions were asked and they simply paid up, which is contrary to the way that department usually operates. This was in January 2004.

Snakes are a tricky area in terms of the law in that they are regulated ("protected") and therefore it is illegal to kill and interfere with them in any way, unless licensed. Other than licensed snake removers like Snakebusters, persons with scientific or photographic permits and authorized wildlife officers, no one is allowed to catch, kill or interfere with reptiles in this state, probably meaning that fewer than 100 out of 4-million-odd Victorians can legally interfere with (wild) snakes in any way.

In other words snakes and snakebite are a potential gold mine for lawyers and persons who may be bitten. Hence, avoiding snakebite is the best option and thus the recommendation to post warning signs and to warn relevant people who may enter or use the hospital.

Noting the legal situation in terms of snakes, the general recommendation to have sighted snakes removed by Snakebusters seems the most sensible option.

Final (main) recommendations

- Remove ivy and creeping vegetation within hospital grounds and replace plant beds with plants on stems as opposed to creeping varieties.
- Block holes at ground level on buildings as practicable and put wire over all drainage routes and "seal" in as much as possible to prevent snake movement via the drainage system into the hospital.
- Clear and modify as practical the swamp area near the carpark to reduce snake habitat, including reducing vegetation in and adjacent to the water bodies and on a regular basis to counter regrowth. Fill in gaps under rocks if possible.
- Consider removal of bulrushes within the hospital grounds.
- Have staff formally briefed by Snakebusters in terms of snakes, snakebite and what to do when snakes are seen.
- Call Snakebusters to remove snakes from grounds as and when seen. This is a 24-hour service.

Report dated 26 January 2004

End note

In the two-year period since the completion of the report (to March 2007), three more snakes have been removed from the hospital complex, but all outside the walled area, indicating that the measures indicated in the recommendations have had at least some measure of success. The major recommendations had been adopted by the hospital management.

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* Editor's note (from the VicRoads website): VicRoads is the registered business name of the Roads Corporation, a statutory Corporation within the Victorian Government . . . under the responsibility of the Minister for Roads and Ports.

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Note on Reproduction of Whipsnakes, Genus *Chironius* (Serpentes: Colubridae), from Costa Rica

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Abstract

Histological examination of testes from *Chironius* from Costa Rica revealed that males undergo an extended period of spermiogenesis encompassing February, June–September, November–December. Tubules of the vasa deferentia contained sperm indicating the potential of insemination during these months. *Chironius* males appear to exhibit a period of prolonged spermiogenesis which has been reported for other snakes from Central America. Clutch sizes for *Chironius* females in Costa Rica are reported. Both *Chironius carinatus* and *C. grandisquamis* were depositing yolk in ovarian follicles at the same time they contained oviductal eggs (eggs in oviducts). This indicates both species may produce multiple clutches in the same year.

The keeled whipsnake, *Chironius carinatus*, is known from southern Costa Rica throughout northern South America to the lower Amazon basin; the green whipsnake, *Chironius exoletus*, is known from Costa Rica south to Ecuador and Peru; the shiny whipsnake, *Chironius grandisquamis*, is known from Costa Rica to northern Colombia and Ecuador (Savage, 2002). Information on clutch sizes of *Chironius* from northern South America is in Dixon et al. (1993). Solórzano (2004) reported on clutch sizes, time of egg laying and appearance of neonates for *Chironius* from Costa Rica. This note provides the first information on the timing of the testicular cycle and observations on the ovarian cycle of *Chironius* species from Costa Rica.

Methods

The following specimens from Costa Rica were examined from the herpetology collection of the Natural History Museum of Los Angeles County, LACM, Los Angeles, California: three *C. carinatus* males (mean snout–vent length, SVL = 1093 mm ± 110 SD, range: 983–1203 mm) and three females (mean SVL = 953 mm ± 168 SD, range: 782–1118); nine *C. exoletus* males (mean SVL = 847 mm ± 88 SD, range: 750–1019 mm) and seven females (mean SVL = 799 mm ± 102 SD, range: 708–1000 mm); five *C. grandisquamis* males (mean SVL = 867 mm ± 146 SD, range: 707–1003 mm) and four females (mean SVL = 973 mm ± 135 SD, range: 849–1160 mm). Specimens collected by province were: *Chironius carinatus* (*n* = 6) Puntarenas LACM 150363-150368; *Chironius exoletus* (*n* = 16) Alajuela 150401, 150402, 150404; Cartago 150393, 150394, 150396-150398, 150406, 150408; Guanacaste 150391, 150395; Puntarenas 150392, 150403, 150405, 150407; *Chironius grandisquamis* (*n* = 9) Heredia 150409, 150415, Guanacaste 150412, 150414, Limón 150417, Puntarenas 150411, 150429-150431. *Chironius carinatus* were collected 1964–1990; *C. exoletus* were collected 1959–1974; *C. grandisquamis* were collected 1959–1982.

The left testis and a portion of the vas deferens were removed from males; the left ovary was removed from females for histological examination. Enlarged ovarian follicles (> 10 mm length) and oviductal eggs were measured to the nearest mm. Tissues were embedded in paraffin and histological sections were cut at 5 µm. Sections were mounted on glass slides and stained with Harris' hematoxylin followed by eosin counterstain. Histology slides from males were examined to determine the stage of the testicular cycle; slides from females were examined for yolk deposition (secondary yolk deposition *sensu* Aldridge, 1979).

The testes of all males were undergoing spermiogenesis (= sperm formation). The lumina of the seminiferous tubules were lined by spermatozoa or several rows of metamorphosing spermatids. Tubules of the vasa deferentia contained sperm. Monthly samples of *C. carinatus* males were: July (1), September (1), November (1): *C. exoletus*: Feb (1), June (3), July (2), Aug (2), Dec (1); *C. grandisquamis* June (1), July (2), August (2). While samples were not available from all months, the collective presence of males undergoing spermiogenesis from most of the year indicates an extended period of spermiogenesis. The smallest spermiogenic male measured 707 mm SVL (C. *grandisquamis,* LACM 150411) and was collected in June.

One female each of *C. carinatus* from June and July was not undergoing yolk deposition. One female (LACM 150363, SVL = 1118) from September contained 9 oviductal eggs. It was also undergoing concurrent yolk deposition in ovarian follicles indicating *C. carinatus* may produce multiple clutches in the same year. One female *C. exoletus* from November and one from December were not undergoing yolk deposition. One female from June (LACM 150407) was undergoing yolk deposition. One female from July (LACM 150395, SVL 729 mm) contained 5 enlarged ovarian follicles (> 15 mm length) and one from September (LACM 150397, SVL 845 mm) contained 6 enlarged ovarian follicles (> 17 mm length) for a clutch to be deposited later in the year. Two females, each from September contained oviductal eggs (LACM 150401, SVL 1000 mm, 11 eggs; LACM 150404, SVL = 770 mm, 9 eggs). Three *C. grandisquamis* females, two from July and one from August were not undergoing yolk deposition. One female from March (LACM 150409, SVL = 1160 mm) contained 6 oviductal eggs. It also exhibited concurrent yolk deposition in ovarian follicles indicating C. *grandisquamis* may produce multiple clutches in the same year. The smallest reproductively active female (enlarged ovarian follicles) measured 729 mm SVL (*C.*

exoletus LACM 150395) and was collected in June.

The following information on *Chironius* clutch sizes from Costa Rica is from Solórzano (2004): one clutch of 8 eggs each from *C. carinatus* and *C. exoletus* were laid in October; *C. grandisquamis* deposited a clutch in October. Information on clutch sizes from *Chironius* from northern South America is summarized in Dixon et al. (1993): clutches of up to 9 eggs for *C. carinatus,* up to 12 eggs for *C. exoletus* and up to 15 eggs for *C. grandisquamis*.

Other snakes from Costa Rica also exhibited extended periods of sperm formation: *Dendrophidion vinitor* (Goldberg, 2003a); *Drymobius margaritiferus* (Goldberg, 2003b); *Ninia maculata* (Goldberg, 2004a); *Erythrolamprus bizona, E. mimus* (Goldberg, 2004b); *Micrurus nigrocinctus (*Goldberg, 2004c); *Hydromorphus concolor* (Goldberg, 2006); *Geophis godmani* (Goldberg, 2007a); *Stenorrhina freminvillii* (Goldberg, 2007b). *Chironius* males appear to fit this pattern of extended sperm production.

Regarding the ovarian cycle, Goldberg (2003a) reported that *Dendrophidion paucicarinatum* from Costa Rica may produce multiple clutches in the same year. The numbers of clutches produced each year by snakes from Costa Rica remains to be determined. Because of the extensive geographic distribution of *Chironius*, examination of samples from throughout its range will be needed to elucidate the reproductive biology of this group of snakes.

Acknowledgments

I thank Christine Thacker (LACM) for permission to examine *Chironius.* Specimens from Costa Rica are part of the CRE collection donated to LACM by Jay M. Savage. Sean Kark (Whittier College) assisted with histology.

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Book Review: *The Amphibians and Reptiles of New York State: Identification, Natural History and Conservation* by James P. Gibbs, Alvin R. Breisch, Peter K. Ducey, Glenn Johnson, John L. Behler and Richard C. Bothner. 2007. xvi + 422 pp. Oxford University Press, Inc., New York, NY. Hardcover: ISBN 978-0-19-530430-5 ($74.50) Softcover: ISBN 978-0-19-530444-2 ($34.50)*

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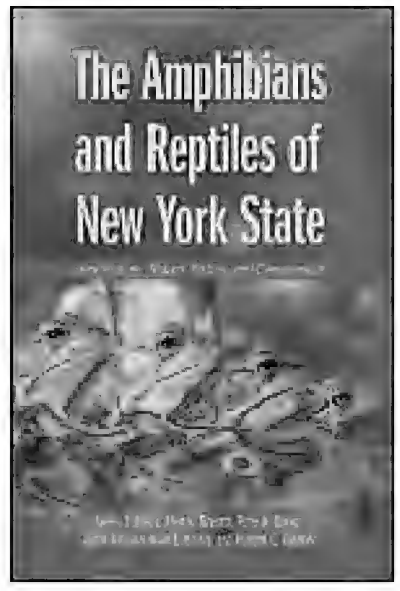

I grew up in western New York State and had my first field experiences with amphibians and reptiles during after-school forays in vacant lots in my suburban neighborhood or family trips to the Finger Lakes region. During those expeditions in search of common gartersnakes, DeKay's brownsnakes, spring salamanders and northern leopard frogs — a dog-eared copy of Conant's (1958) field guide tucked in my pack—I developed a deep fascination with these animals which I still have today. In those days, I was probably unaware that there was such a thing as a regional field guide, written for a particular state or group of states. However, when I recently discovered that a herp guide for my home state finally had been published, I knew I had to buy a copy—even though I have not visited that part of the country for more than 20 years!

Although I refer to this book as a field guide—it is certainly small enough to carry with you when you venture away from home or office—it includes more than just information for identifying animals that you encounter in the field. Conservation has become a much more prominent part of biology in the last few decades, and this book reflects that by devoting a significant amount of space to this issue. Perhaps this will be the trend in future state wildlife guides, in recognition of the fact that it is no longer enough to focus on just identifying and studying animals in the field but learning how to keep them a part of the landscape.

The Amphibians and Reptiles of New York State covers 69 species that are native to the state, including 18 salamanders, 14 frogs and toads, 17 turtles, three lizards, and 17 snakes. Also included are an additional three non-native species (northern red-bellied cooter, pond slider and Italian wall lizard) that have become established. The species accounts follow the general format used in many other state guides, but there are a couple of nice differences. Each account includes subsections entitled "Quick Identification" (a one or two sentence description of identifying characteristics) and "Description" (a more detailed discussion of characteristic features of the species). Other subsections address habitat, natural history, and status and distribution. The final subsection, called "Other Intriguing Facts," provides notes on natural history or other aspects of the species that may be of interest. Most of the species accounts are about three pages long. There is no detailed information on the taxonomic history or subspecies in the species accounts, which might be a disappointment for professional herpetologists who have come to expect these data in a state guide, but such omissions probably will not impact the utility of the accounts for most readers.

The range maps consist of a simple base map of New York, including county lines, with the inclusive distribution of the species indicated by a shaded pattern. Some of the maps for species with small, isolated populations include locality dots, but other more common species are simply shown as occurring statewide. The information for mapping distributions was apparently derived mainly from the New York State "Herp Atlas" project.

The color plates are grouped at the middle of the book and include photos and a few drawings of all covered species; nearly all are excellent and well-produced. Each plate is accompanied by comments on identifying characteristics. Black-and-white photos are scattered throughout the book and illustrate habitats, interesting behaviors of species, herpetologists working in the field, and various topics of conservation interest. There are also some interesting historical photos.

The scientific and standard English names generally follow those proposed by Crother et al. (2000 [2001], 2003), although the English names used by Collins and Taggart (2002) are also provided parenthetically (a good idea, since there are a few species which have rather different names in the latter publication). As mentioned above, subspecies are generally not discussed except where necessary, such as in the account for the introduced pond slider which has two distinctive representatives in New York (*Trachemys scripta scripta* and *T. s. elegans*). Perhaps the authors believed that the additional text required to address subspecies would be too lengthy and was largely unnecessary given that few of the covered species that are polytypic have more than one geographic race in New York. Type localities and original descriptions are not mentioned except for the 18 species described from the state; these are nicely summarized in Table 2.3.

The latter part of the book includes a detailed discussion on herpetological conservation in New York State. Chapter 8 ("Threats") discusses a range of topics including persecution of

some species; over-exploitation of herps for food and lab animals; habitat loss and fragmentation; acid rain and other pollutants; and road mortality. Chapter 9 ("Legal Protections") reviews the laws and regulations that afford protection to herp species and their habitats, and Chapter 10 ("Habitat Conservation Guidelines") describes various ways that habitat loss can be avoided or minimized. Chapter 11 ("Conservation Case Studies") highlights some ongoing conservation work for species such as Blanding's turtle, massasauga, diamond-backed terrapin and spiny softshell.

There are also sections on how to find and study herps in the field, regional folklore about some species, and information on how to participate in the state's "Herp Atlas" project. Other sections address the topography and habitats in the state, and various resources available to interested readers, including local and national organizations and reference books. There is a glossary of terms used in the book, an extensive Literature Cited section, and an index of names and topics. Absent is an identification key for covered species. All in all, there is a lot of information in a small volume.

I was a little disappointed that the species accounts are sometimes rather brief and the information provided occasionally lacks citations. The six authors apparently incorporate their field observations and those of others in the accounts, which provide a "New York perspective" on the natural history for many species. Table 5.1, for example, provides information on early, middle and late dates for calling of anurans in three areas of the state, derived from the state's "Herp Atlas." Absent is a section that discusses species that might occur within the state's borders but have not been confirmed there; this information is often useful for alerting field workers of possible new discoveries to be made. Although I would have liked to see more detailed information in some places, these additions would have added many more pages and turned this volume from a field guide into a desk reference. The extensive section on conservation in New York is a nice addition that, although not a necessary part of a field guide, provides a lot of context for why it is important to know the species in this state.

The book is well written. I found relatively few typographical and grammatical errors. The text is not overly technical for the student or the interested adult who is not a professional biologist.

I highly recommend this book to anyone interested in the herpetofauna of New York or adjacent parts of the U.S. and Canada. The paperback version that I purchased is durable, well worth the reasonable price, and will fit quite comfortably in my field pack, should I someday make a trip back to my old stomping grounds.

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What You Missed at the August CHS Meeting

by John Archer
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Early on in his talk, Doug Mader joked about having only five hours to give his presentation. He is too astute to really talk for that long, but I have no doubt that Dr. Mader could hold the attention of an audience for five hours or longer. Few speakers have the rapport with an audience that Doug Mader achieves. He had all of us laughing throughout his appearance at our August meeting. Constantly interacting with the audience, including the kids, he lightheartedly led us through an introduction to the state of veterinary medicine for reptiles and, much to my delight, amphibians (No, I'm not obsessed with amphibians. I just feel that they often take a back seat to reptiles in our organization.)

Dr. Steve Barten, as a long time friend of Dr. Mader, gave the introduction, and if anyone in the audience was less than enthusiastic about hearing the speaker, they couldn't have felt that way after Steve's introduction. Dr. Mader is a regular columnist for *Reptiles* magazine, has a veterinary practice in the Florida Keys, spends much of his time working with rescue organizations and zoos, and in his spare time, happened to write and edit the definitive book on reptile medicine, *Reptile Medicine and Surgery*. And rewrote it. The new edition is only one thousand, two hundred, and sixty-seven pages long. Doug mentioned that he hasn't finished reading it yet.

He started with the gracious comment that he was excited to be speaking at the CHS, because he had spent many hours in the graduate library pouring over our *Bulletin*, and because he hadn't been to a herp meeting in quite awhile. He stopped attending the meetings of the local group in the Keys when the other member moved away and he became tired of talking to himself. I can't say that any of his humor was subtle, but all of his jokes were greeted with laughter, and there were a lot of jokes. What impressed me was how much I learned through his comedic style.

Doug gave us a brief overview of his life so far, claiming that his first job was in a snake wash, and showing a picture of a small child in a washtub scrubbing a large python. He followed with a picture of himself in the seventies with a seventies haircut, seventies mustache, and seventies clothes, asserting that he looked like Tom Selleck. Only Tom Selleck wouldn't have been holding a large Burmese python. He was successfully breeding pythons when they could be sold for hundreds of dollars, and the snake breeding paid for his graduate school. Then he gave us a brief overview of reptile medicine history.

A slide of a 1936 pamphlet showed the first reference he has found for reptile medicine. Written by an MD, it was only four pages long. The first serious guide to reptile medicine, *Veterinary Biology and Medicine of Captive Amphibians and Reptiles*, was written by Dr. Leonard Marcus in 1981, who was a vet, then became an MD, and is now a doctor specializing in travel medicine. Even as late as the mid-eighties, when Doug was working in zoo animal medicine, the standard method of anesthetizing a reptile was to refrigerate it.

So then Doug brought us to the twenty-first century, where veterinary medicine can offer reptiles nearly all the procedures that are available to dogs, cats, and even humans. Vets can draw blood, do cardiac ultrasounds, perform CT scans, monitor blood pressure and gases, use laser surgery, maintain the animals on ventilators, give blood transfusions and perform endoscopic procedures. We've come along way from simply putting a sick herp in the freezer. To demonstrate, Dr. Mader took us through a few case histories. The titles are his.

Horned Frog with Stomach Ache

A slide of a very unhappy "Pacman" frog (*Ceratophrys ornata*) flashed onto the screen. When Doug lifted it, it felt like a beanbag. An X-ray revealed a stomach full of rocks. With multiple slides to illustrate the procedure, Dr. Mader took us through the setup and successful execution of surgery to remove the stones, followed by a picture of the fully recovered patient. The pictures showed the frog looking like a cyber-frog, with tubes going into his mouth and body, wrapped in sterile coverings atop a heated and moist pad. Major surgery was being performed in a situation that twenty years ago would have ended in the freezer compartment of a refrigerator. Doug claims that the owner made a necklace of the now very expensive stones.

Indigo Snake with a Cold

Dr. Mader was the third vet to treat this eight-foot-long animal (*Drymarchon corais*). The snake had a respiratory problem, which was treated with Baytril by the first vet, and then more Baytril by the second vet. It was still obviously a very sick animal when Doug finally had his chance, and he had the apparently novel idea of actually trying to diagnose the disease rather than simply guess at a treatment. A complete physical included X-rays that revealed parasitic worms in the snake's lungs, eight to be exact, each about eight inches long and the diameter of a pencil. A brief explanation of the problems of killing the worms without removing them and the difficulties of doing endoscopy on an eight-foot long animal, and Doug's pictures were taking us on an interior view of a snake's lungs through the magic of photography. I felt like I was in the movie *The Fantastic Voyage* (younger readers will need to look that up). We viewed huge pictures of parasitic worms being yanked out by the head, which is not as gross as it sounds, especially with Dr. Mader doing little high-pitched voices of the worms as they're extracted. The snake recovered nicely.

Beardie with a Headache

Sam the bearded dragon (*Pogona vitticeps*) was admitted with a large hematoma on his head that was obviously causing him pain. CT scans of the head showed not one, but two hematomas, and a dye injection showed two leaks in the arteries. Three-D imaging using sophisticated software allowed Dr.

Mader to plan his approach through the skull and allowed him to remove the hematomas and repair the tears with tiny staples. The entire time the patient was being given fluids and was on a ventilator, while blood pressure and body temperature were being monitored. A transfusion restored the lost blood with blood drawn from another bearded and cross-matched for type. Sam lived two more headache-free years and died of unrelated causes. Then Dr. Mader wanted someone to ask the obvious question, and it was. Cost? The procedure was expensive, and he admitted not appropriate in all cases, but he wanted to demonstrate the level of care available. And, he added, it's not unusual to spend thousands on a dog that may live only a few years, so what is it worth to have a healthy animal with which you have bonded and may live twenty-five years?

The Sinking Sea Turtle

A green sea turtle (*Chelonia mydas*) that had a large hole cut in his plastron in order to remove an impaction arrived at Dr. Mader's hospital from another facility with a wound that wouldn't heal. In most turtles this type of operation results in fairly consistent healing and successful recovery, but sea turtles don't retain patches like land turtles or tortoises do. Doug likened it to sticking scotch tape on a bar of soap. When the patch gets wet, it falls off. So every day they cleaned the wound with disinfectant, gave the turtle IV fluids, fed it through a tube, and packed the wound with clean bandages. There is only anecdotal evidence about how long a sea turtle may last out of water, so the anxiety was high while the wound slowly closed. Finally only a small hole stubbornly refused to heal, so medical Gore-Tex was placed over the wound, providing a matrix for the flesh to grow through. The turtle was finally released into the ocean after nearly eight months of treatment. Slides of the turtle's wound were some of the most unsettling of the talk, but, to offset those, Doug showed cool video clips of a carbon dioxide laser in action.

Dr. Mader ended his talk with a presentation about The Turtle Hospital, a sea turtle rescue organization dedicated to the care and rehabilitation of injured and sick sea turtles. I'm once again chagrined that I've run out of time and space to cover the rest of his talk. Doug took us on a tour of the facilities where he regularly spends many hours caring for the turtles. The hospital is on Marathon Key and is a state of the art facility that is not only doing tremendous rescue and recovery work on sea turtles, but is conducting cutting-edge research in those areas, especially the huge increase in turtles with fibropapilloma tumors. I have to quote Dr. Mader when he spoke with obvious affection and respect for the man who founded the hospital and is its director. Doug described Richard Moretti as a man with more energy than "a Pomeranian on espresso." Mr. Moretti provided all of the funding for the hospital at its beginning, and still spends much of his money on the turtles. I know Dr. Mader will be disappointed that I haven't written more about the plight of sea turtles and the good work that The Turtle Hospital is doing. Visit them at www.turtlehospital.org. Come away impressed.

Doug closed his talk with a picture of a live two-headed baby green sea turtle with X-rays showing its (their?) two necks and one spine. Each head has a lung to itself. So far it's doing fine. How cool is that? For over an hour Dr. Mader had us enthralled and amused, and, while I'm certainly not prepared to perform major or even minor surgery, while busy laughing at Doug's jokes I managed to gain a new appreciation of the state of veterinary medicine and what it can do for our animals. My respect for all veterinarians increased, especially those in our society who are concerned with herps. Dr. Mader's presentation gave us a little insight into what it takes to deliver first-rate care. Heck, I might even have to be nicer to Drs. Barten and Herrmann.

Bull. Chicago Herp. Soc. 42(9):154-155, 2007

Notes on the 2006 Midwest Herpetological Symposium

Compiled* and written by
Holly Carter
Secretary — Hoosier Herpetological Society

The Hoosier Herpetological Society (HHS) hosted the annual Midwest conference that was held at the Westin Hotel in downtown Indianapolis, Indiana, November 3-5, 2006. This reptile and amphibian conference travels around the Midwest and is hosted each year by a different regional herpetological society. This has been going on for 22 years and is a must on many herp lovers' calendars.

The local herpetological society has the daunting task of putting the symposium together by arranging hotel/lecture areas, speakers, hospitality, audio/visual equipment, travel, banquet and activities. Most of the symposiums also include an animal / dry goods sale as well. Thanks to Brian Hahn of Midwest Reptile Shows, the Hoosier Herpetological Society was able to provide the attendees with this segment in the form of the Indy Reptile Expo.

Speakers are chosen to represent different areas of herpetology. They are asked to be informative yet not academic, so that beginners as well as experienced herpers can enjoy while learning.

HHS members worked throughout the year prior to the conference to obtain examples of native Indiana amphibians and reptiles to display at the symposium. That meant maintaining these creatures and keeping them healthy for the November showing. In addition, the HHS worked with the Indiana Department of Natural Resources to arrange an outstanding display of animals from the O'Bannon Woods State Park nature center in Corydon, Indiana. Our thanks to Jarrett Manek and Chris Bell for staying all weekend, helping with photography, answering questions and making everyone wish it was spring instead of winter so they could go out and find some of these animals that were presented.

The HHS opened the symposium with the Friday night ice-breaker, where attendees could meet and greet both old and new friends. The Minnesota Herpetological Society included entertainment at the previous year's conference and we thought it was a good idea, so we arranged some also.

Larry Battson of Wildlife Education Services in Greencastle, Indiana, brought in some live specimens: Gila monster, alligator, 5' monitor and huge alligator snapping turtle. He gave a humorous yet knowledgeable presentation on each animal.

Rupert Boneham (Survivor TV series participant and Indianapolis native) hilariously recounted some of his experiences on the show and in real life. He also did an outstanding job as auctioneer and commentator during our fund-raising auction.

Mark Heinrich and Jerry Young entertained with songs from Mark's herp-oriented CD (Alterna Rush) that many of us field herpers could relate to. Lyrics are phrased to appeal to those with a herper's sense of humor.

We then adjourned to the hotel hospitality suite where a dynamic view of downtown Indianapolis greeted everyone. Munchies of pizza, chips, fruits, veggies wine and beer, beer, beer were readily consumed. One area was showing field and other herpetology slides with ready commentary on different aspects of photography, nature and travel. Another area had everyone relaxing with conversations all around well into the wee hours.

Saturday morning, after the continental breakfast to get everyone jump-started, the talks began:

- Bob Ashley and Tell Hicks discussed their fieldwork in Arizona in preparation for a book to be titled "Rattlesnakes of Arizona." Tell Hicks is illustrator for the project.

- Richard Reams of Indianapolis Zoo told what it was like to go herping in Australia. Because Australia is an English-

Larry Battson and his American alligator. Photograph by Jim Horton.

Mark Heinrich (on banjo) and Jerry Young. Photograph by Jim Horton.

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* Partly based on a report by Eugene Holmes in the newsletter of the Central Illinois Herpetological Society.

Amphibians and reptiles of Indiana on display. Photograph by Jim Horton.

One of the auction tables. These items all came from the estate of Dr. Sherman Minton. Photograph by Jim Horton.

speaking, developed country with good roads and is safe to travel in, Richard found it to be a herper's dream. Of course it also helped that he found over 100 species of herps there.

• Dr. Bruce Kingsbury (Biology Professor at IU/Purdue in Ft. Wayne, Indiana) talked about his field research with timber rattlesnakes and massasaugas, including topics such as habitat, camouflage, hibernation and legal protection.

• James Harding (Michigan State University) discussed the plight of the wood turtle. Because they take a long time to mature, every adult turtle is critical. Heavy predation by "subsidized" predators (namely raccoons) and collection by humans have taken their toll. Head-starting turtles won't help if the adults can't survive.

• Zach Walker (Indiana State Herpetologist, Indiana Department of Natural Resources) based his talk on five species being monitored by the DNR: hellbender, green and mole salamanders, green treefrog and crawfish frog. Pollution and other habitat changes are main areas of concern.

• Greg Maxwell (author of *The Complete Chondro*) told of husbandry and breeding of green tree pythons with regard to caging, humidity and privacy. Feeding regimens were suggested for both adults and juveniles.

• Ed Kowalski (Philadelphia Zoo) covered the husbandry and natural history of three species of caecilians. These amphibians are uncommon in captivity and have not been studied well in the field due to the difficulty in locating them.

• Will Bird and Phil Peak (president and vice-president, Kentucky Herpetological Society) spoke about their herping adventures and how they arranged to become designated agents of the Kentucky Wildlife Department confirming locations and concentrations of herps in areas across the state.

• Completing the daylong schedule was Dr. Brady Barr of the National Geographic Channel's "Reptile Wild" and "Dangerous Encounters." Dr. Barr had spent 5 years teaching high school in Indianapolis, Indiana, before going on to complete his PhD and spent 15 years working with crocodiles worldwide. Barr, the only person ever to have captured all 23 species of crocodilians, took us behind the scenes of his TV productions. He related how he is currently working on laser equipment that can give the exact length of a snake. He tested it by flying over a basking python, then capturing it and hand-measuring to show the accuracy. He is also working on ways to measure "bite force." He got an 18-foot crocodile to bite his measuring device and it was able to produce over 5,000 psi of pressure.

Dinnertime arrived with a banquet followed by speaker Whit Gibbons, professor of ecology at the University of Georgia and head of the environmental outreach and education program at the Savannah River Ecology Laboratory. Gibbons touched upon many environmental concerns, including development, pollution, disease, climate change and invasive species. He stressed that ecological research and education are needed to lead to conservation.

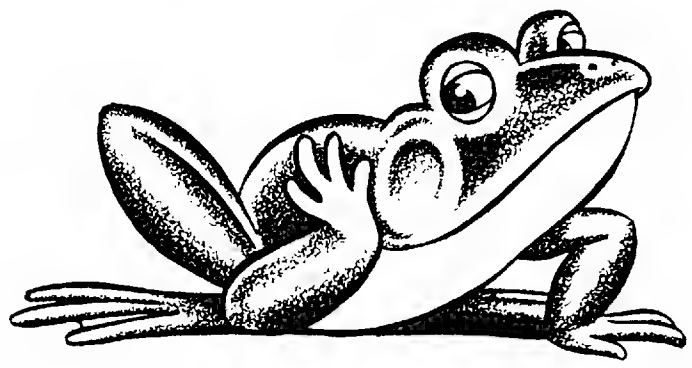
The annual auction followed, encompassing generous donations of herp-related items as well as animals helped with many dollars being raised. Hospitality suite remained open after the auction to allow more discussions and get togethers.

The Sunday events included free admission to Indy Reptile Expo, Indianapolis Zoo (with behind the scenes tours) and Indiana State Museum.

I encourage everyone to get involved with their regional herpetological society and the many symposiums that occur around the country. The next Midwest Herpetological Symposium will be held in Des Moines, Iowa, on November 10-11, 2007, sponsored by the Iowa Herpetological Society, (563) 785-6338 or www.iaherp.org.

The Tympanum

Response to Hoser's letter



Concerning Raymond Hoser's vitriolic attack against the use of tongs for handling venomous snakes, I adamantly disagree.

I have never been to Australia and I must say that I have had very little experience in handling large elapids. However, I have had over forty years of experience in handling hundreds of pit vipers and coral snakes, both in the field (North, Central and South America) and in captivity, and have never once been bitten. I credit this perfect track record to common sense and the use of good tools, including tongs.

I bought my first Pilstrom snake tongs when I was 13 years old (I'm a ripe old 54 now) and I still have them, as well as those of the newer design. The old Pilstrom tongs had a sort of tongue and groove jaws; the top narrow movable part fitting inside the bottom fixed part. This isn't as good a design as the newer ones, but they are safe if used correctly and I have collected countless numbers of pit vipers and a few coral snakes with them. None of these snakes were injured in the least, and those I've kept thrived in captivity for as long as fifteen to twenty years.

Nowadays, I generally prefer to carry a hook in the field, mainly because I can also use it as a walking stick and to flip over objects. I have no problem bagging pit vipers or even coral snakes with it, though it sometimes requires time and patience. But in situations where the snake must be bagged quick, such as on a road with approaching traffic, tongs are invaluable. There are some snakes which will not stay on a hook, and for those the tongs are much more useful.

Mr. Hoser states that "on a smooth surface (where the tongs work best) the metal grip crushes the snake's ribs (leading to what will almost certainly be fatal injury). This outcome invariably occurs whenever tongs are used." This is a gross exaggeration. As Mike Dloogatch said in his response to Hoser, you can put a finger in tongs and squeeze as hard as possible and not cause a bit of pain. This is true even with the old Pilstrom tongs. And for the record, they actually work better on an uneven surface, but I suppose that Mr. Hoser hasn't had much experience with them.

Hoser also states "in my view, for thick set snakes, wild ones are best caught with a pinning device, then by using a second one, pinned by the head." This technique is far more dangerous to the snake than grabbing it mid-body with tongs! The force it takes to restrain a large snake from twisting free can easily cause severe injury to the delicate vertebral bones in the neck. Not to mention the increased risk to the handler. There are few circumstances where any snake needs to be pinned rather than hooked or tonged: one instance that comes to mind was when I was recently catching a copperhead in a wind storm with fire ants crawling up my leg! Some snakes are too large for tongs, and for those a hook (or even sometimes two hooks) is much better.

Mr. Hoser describes watching a man catch a tiger snake with tongs and damaging the snake. In his description of the event, the man pulled the snake with the tongs while the snake held on to a cylinder on the ground. Clearly, this was a stupid thing to do but the injury was caused by pulling on the snake; if the man had pulled on the snake with his own hands, the outcome would have been the same. This is not to say that tongs can't injure a snake if misused. Snakes must always be grasped mid body; never by the neck or tail. It's best to slide the bottom part of the tongs under the snake as one would do with a hook, then apply just enough pressure to hold the snake. Used like this, the tongs safely support the snake like a hook with enough pressure above to keep the snake from sliding off. Tongs are merely a tool, and like any tool they are only as good as the user. Newer tongs have wider jaws which are smooth and gentler, but even these can cause damage to a snake if they are misused. Snakes should not be held with the tongs longer than it takes to move them to wherever they're going. And if the snake is holding on to a something such as a tree branch, then of course pulling it with the tongs can seriously injure it.

I have read Hoser's articles with interest, and since most of them have dealt with subjects I'm not familiar with, I haven't had an opinion about them one way or another. But his blatantly false statements regarding snake handling give me reason to question his credibility on everything else he has written.

Sincerely, **William B. Montgomery, PO Box 656, Elgin, TX 78621. Montgomery53@sbcglobal.net**

Unofficial Minutes of the CHS Board Meeting, August 17, 2007

The meeting was called to order at 7:32 P.M. at the Lake Forest Discovery Center. Board members Rich Crowley, Kira Geselowitz and Cindy Rampacek were absent.

Officers' Reports

Recording Secretary: In Kira's absence, Mike Dloogatch read the minutes of the July 13 board meeting.

Treasurer: Andy Malawy reviewed the July financial reports.

Membership Secretary: Mike Dloogatch reviewed the membership records, noting a slight increase for the month.

Vice-president: Steve Sullivan reported that Dr. Douglas Mader would be speaking in August, Dr. Daniel Beck in September, a representaive from the Clyde Peeling reptile exhibit [Reptiles: The Beautiful and the Deadly] in October, and Rob Carmichael and Mike Corn in November. Also, the Reptiles exhibit will be open for CHS members beginning at 6:00 the night of the November meeting.

Publications Secretary: Erik Williams solicited ideas to increase usage of our web forum.

Sergeant-at-arms: Jason Hood reported attendance at the July meeting was 49.

Committee Reports

Nominating committee: This year's committee members are Dan Bavirsha, Mike Dloogatch, Dotty Humbert, Deb Krohn and Ralph Shepstone. The committee has already met once and has made substantial progress in choosing a slate for the November election.

Shows: The Illinois State Fair was hot but productive. The Lieutenant Governor's staff indicated interest in sending representatives to ReptileFest in 2008. October 17 is an open house at the Nature Museum and the 26th is a show at Springbrook Nature Center. November 10 is Snake Day at the Milwaukee Public Museum. March 2 is Reptile Rampage at the Lake Forest Discovery Center; March 14–16 the Chicagoland Pet Expo will return to Arlington Park.

Grants: The committee for 2008 will be Mike Dloogatch, Deb Krohn, Jason Hood, and Steve and Amy Sullivan

Raffle: Nancy Kloslowski will run the raffle at the August meeting.

General meetings: Cindy Rampacek will give a short on the International Reptile Conservation Foundation in August.

Old Business

Erik Williams agreed to update the CHS business/meeting advertisement cards.

Cindy is working on the "what you missed at the last meeting" advertisement flyers.

New Business

The CHS and Peggy Notebaert Nature Museum will partner for the duration of the Clyde Peeling reptiles exhibit including reciprocal web links and flyer placement, advertisement of events on each other's forums and email lists, and a sign up sheet for exhibit visitors to get more info from the CHS.

Steve will look into the placement of a sign that advertises CHS meetings in the lobby of the PNNM

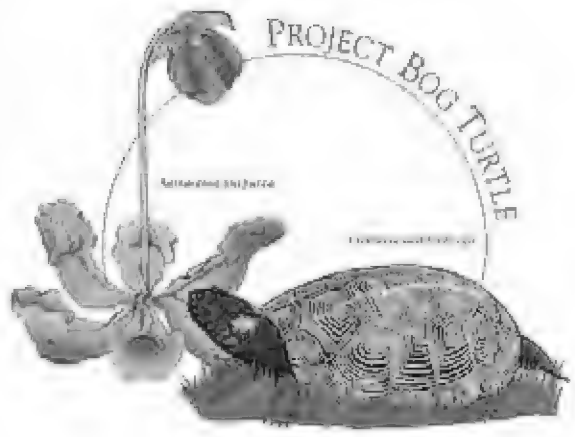
Round Table

- Steve reported that while in the visitor's center at Bryce Canyon he had a chance encounter with members Joey and Gayle Robinson who had just driven there from San Diego. It's a small world when you're part of the CHS.

The meeting was adjourned at 9:16 P.M.

Respectfully submitted by Steve Sullivan

PROJECT BOG TURTLE BENEFITS FROM 2007 DAYTONA EXPO'S AUCTION



This year the National Reptile Breeders' Expo in Daytona, Florida, raised over $15,000 for Project Bog Turtle. This was the sixth year that auctions have been held to raise money for reptile and amphibian conservation efforts. This year well over 200 people participated in the auction. To date nearly $100,000 has been raised, most going directly to developing nations where these funds go much further than they do in the United States. The money goes directly to private sector conservation programs, so none of it is used for overhead, travel and similar expenses that are tacked on by large conservation organizations, government agencies and academic institutions. The concept is that it's not how much money is available, but how wisely it will be spent. Only programs with established track records are considered for the annual benefit. In the past these auctions have benefited the Turtle Survival Alliance, the Asian Turtle Consortium, endangered crocodile programs in Venezuela and the Philippines, the International Reptile Conservation Foundation (various endemic West Indian rock iguanas), and Project Heloderma (Guatemalan beaded lizard). David S. Lee, The Tortoise Reserve, coordinates the auction and is responsible for overseeing the nomination process of prospective beneficiary organizations.

In the southeastern United States bog turtles have a habitat-specific, limited range and the wetlands they inhabit are small and widely scattered. The total population is estimated at between 4,000 and 6,000 individuals. This compares to a total population of 10,000 to 13,000 in the Northeast (Maryland to New England). The southern populations are mostly in the Appalachians where they are restricted to only about 100 active sites. The species is protected throughout its entire range by state agencies and the U.S. Fish and Wildlife Service.

Project Bog Turtle is an independent, private sector, all volunteer, conservation initiative that officially started in 1995, though a number of its members were working on various aspects of bog turtle conservation in the Southeast for several decades prior to this, long before many agencies recognized the conservation concerns for the turtle and its fragmented wetland habitats. Through the North Carolina Herpetological Society they have received funding from agencies and private donations. The group is effective because they work well with private landowners who are often unwilling to cooperate directly with government agencies. Approximately 75% of all southeastern bog turtle sites are on private lands.

Inventory of both historic and currently occupied sites and estimating population sizes have been major activities of Project Bog Turtle. As recently as last year two new sites were discovered. Of the 179 individual turtles found last year 156 of them had been found and marked in previous seasons. Field work indicates the following estimated turtle populations in currently occupied sites: GA, ~100; NC, 2,000–3,000; SC, < 50; TN, ~150; and VA, 2,000–3,000.

Project Bog Turtle initiated a conservation lease program that allows private landowners to retain ownership of their property and encourages them to protect the wetlands on which the turtles depend. The leases offset land taxes and any profit the owners could make if they converted the site to some economic use. Moderate grazing and other traditional practices actually are of benefit to the turtles and are encouraged. Funds to pay for the leased land have come from the U.S. Fish and Wildlife Service and private donations. Through this program many landowners have become interested in the long-term welfare of the bog turtle sites and in turn often have encouraged their neighbors to take part.

Site management is necessary in many of the wetlands, particularly where grazing is no longer in practice. In 2006 nearly 50 volunteers worked on the restoration and management of sites, removing red maples, alders, multiflora rose, swamp rose, various other invasive species and trash.

Captive breeding, protection of eggs in natural sites, and head-starting are all tools being used in the Southeast to enhance depleted populations. Project Bog Turtle members have established successful captive breeding programs in Tennessee, North Carolina and Georgia. Two years back volunteers started PIT tagging wild caught turtles, recording relevant data, and releasing the turtles. This will help in recognizing animals illegally collected, as well as tracking growth and movements of these long-lived turtles. The effort is ongoing — to date over 300 individuals have been implanted.

Funds generated from the 2007 Daytona Benefit Auction will be use to expand many of the above listed programs, but because of federal budget cuts much of the money donated will be used for the land lease program in 2008. Secondary priorities are increasing the PIT tagging and wetland restoration efforts for specific Southeastern populations. These sites are small, most only several acres in size, so what may seem like only a small amount of volunteer time can make a big difference. The members of Project Bog Turtle thank all who donated to and participated in the auction, in particular Wayne Hill, who makes the annual fundraiser possible, and *Reptiles* magazine for sponsoring the pre-auction socials.

Have Fun!

This is the fifteenth anniversary of

ReptileFest

April 12 and 13, 2008

You gonna miss that?

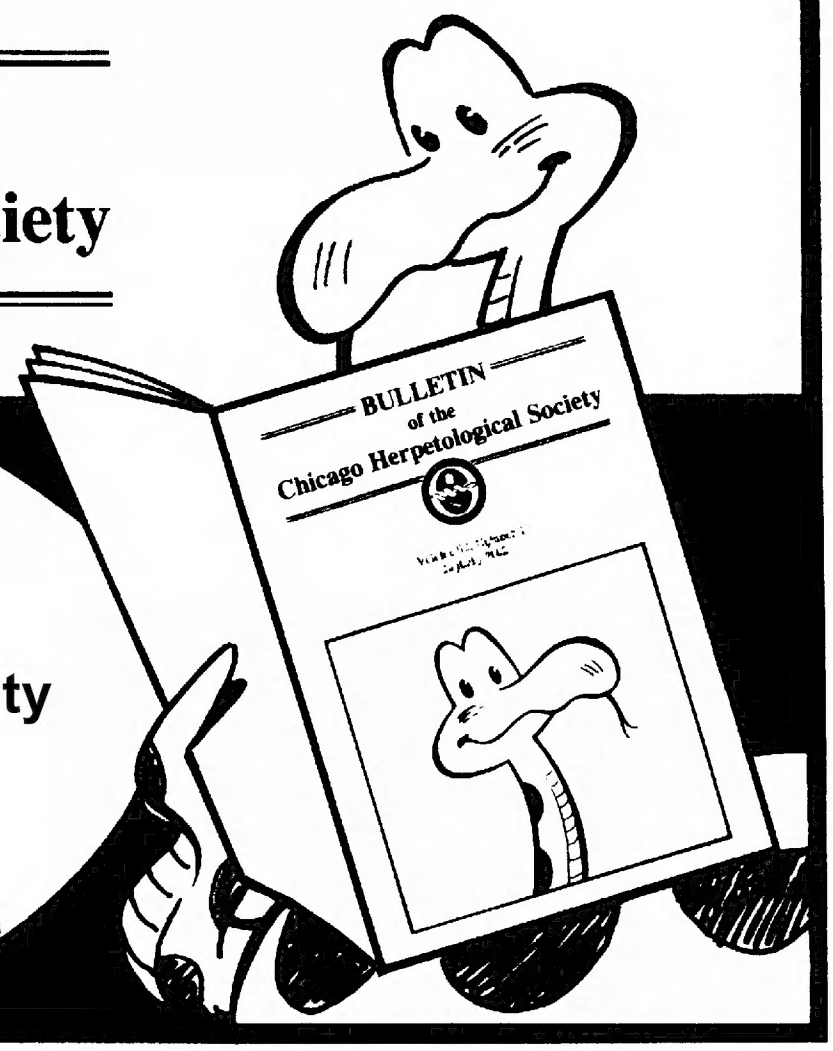
25 YEARS OF SPOT CARTOONS

FROM THE

BULLETIN

of the

Chicago Herpetological Society



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Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. PO Box 85, Alpine TX 79831. Call **toll-free** at (800) 720-0076 or visit our website: < http://www.themousefactory.com> .

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For sale: Graptemys.com T-shirts, 100% cotton, pre-shrunk, pigment-dyed shirts with the Graptemys.com embroidered logo. These are very high quality shirts with that stylish faded look. Sizes S-M-L-XL-XXL. Colors: Pacific blue, nautical red, brick red, plum, granite, khaki green and putty. All profits made from these shirts goes directly to in situ *Graptemys* research. $20 each with $3.00 shipping. Email: chris@graptemys.com or call (239) 437-4148 to order. You can look at the shirts at http://www.graptemys.com/shirts.htm

For sale: books. *Amphibians and Reptiles of Texas* by James R. Dixon, 1987, 434 pp., 20 b&w photos, 18 figs. (drawings), 156 range maps, 32-page bibliography of complete references of Texas herpetology literature from 1852 to 1982, keys to Texas herpetofauna, softbound, $15; *The Snakes of Arizona* by Jack Fowlie, 1965, 164 pp., b&w photo and range map of each species and subspecies, signed by author, hardbound, $40; *Boy's Book of Snakes* by Percy Morris, 1948, 185 pp., many b&w photos, a few ink marks at bottom of introductory pages, hardbound, $10; *Reptiles of Australia* by Charles Barrett, 1950, 168 pp., many b&w photos, figs, drawings, no DJ, hardbound, $80; *The Preservation of Natural History Specimens — Vol. 1, Invertebrates* by Reginald Wagstaffe and J. Havelock Fidler, 1955 (reprinted 1961), 205 pp., 139 figs., ex-library with library stamps and card pocket, but otherwise very good condition (i.e., clean, no text markings, firm binding), DJ, hardbound, $25. All books are in excellent condition except as noted. Postage and handling $2.50 for orders under $25, free for orders $25 and over. William R. Turner, 7395 S. Downing Circle W., Centennial CO 80122; phone (303) 795-5128; e-mail: toursbyturner@aol.com. Send e-mail address for complete book list.

For sale: I am trying to downsize my collection as I move into my new apartment in Chicago and am looking to sell two of my more recent acquisitions. Both are about 2 years old now. I have a female Chihuahuan mountain kingsnake (*Lampropeltis pyromelana knoblochi*) for $100 and a beautiful male jungle carpet python (*Morelia spilota cheynei*) for $200. Please contact me at (217) 390-7672 or mroconnoDVM@gmail.com if you would like to see pictures or purchase them.

For sale: Jungle carpet pythons hatchlings from trophy bloodlines (parents are vivid yellow on jet black and colorfast with age), $200 each or $300 for 1.1 pair. You can check out my collection at http://moreliapython.googlepages.com/. E-mail John for pictures or more information: junglejohn@tds.net.

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Virtual Museum of Natural History at www.curator.org: Free quality information on animals—emphasis on herps—plus expedition reports, book reviews and links to solid information. Always open, always free.

Line ads in this publication are run free for CHS members — $2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, September 26, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. The featured speaker will be **Dr. Daniel D. Beck**, professor of biology at Central Washington University in Ellensburg, Washington, and the author of *Biology of Gila Monsters and Beaded Lizards*. Dan's program will cover "Biology of Bumpy Lizards, New Icons of the Value of Biodiversity."

Speaking at the October 31 meeting will be a representative from Clyde Peeling's Reptiland, creators of the traveling exhibit, "Reptiles: The Beautiful and the Deadly," which opens at the Notebaert October 12.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

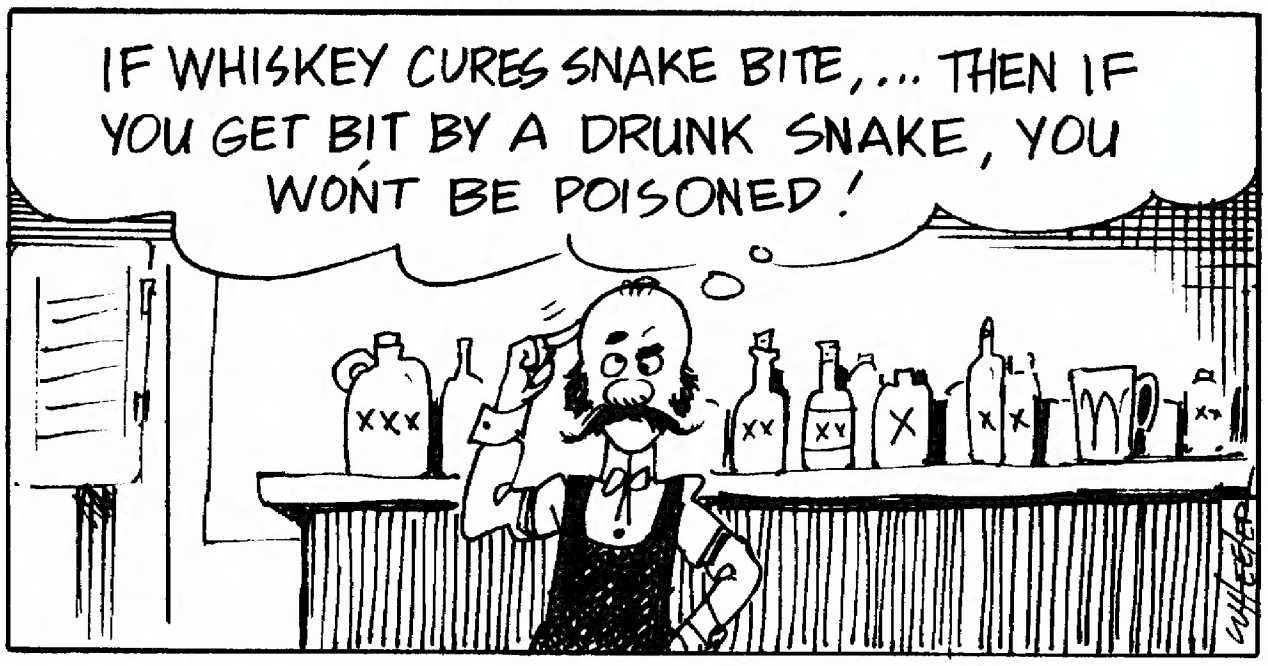
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the next board meeting, to be held October 19. For information as to where the meeting will be held and directions, call Mike Dloogatch evenings at (773) 588-0728.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info visit the CTC website: http://www.geocities.com/~chicagoturtle.

THE ADVENTURES OF SPOT



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